Thus it appears that *N. clavipes* is not altogether unworthy of comparison with the great Madagascar species in regard to its web. It is one of the very commonest spiders of Jamaica, as I have myself observed, and has a wide distribution in the neotropical region. T. D. A. COCKERELL.

Las Cruces, New Mexico, U.S.A., February 8.

The Cloudy Condensation of Steam.

WITH reference to Prof. Barus's letter (p. 363), I have never suggested that condensation nuclei in smoke, &c. would "remain distinct indefinitely," but that, if there were no chemical action, they would hardly disappear in the course of a few seconds.

There is no mention in my lecture of "dissociated particles," or of the dissociation of platinum at red heat. What I said was that electrical discharges and incandescent substances probably caused dissociation of oxygen and nitrogen in the surrounding air (*ante*, p. 214). SHELFORD BIDWELL.

February 22.

Astronomy in Poetry.

WITH reference to the note in the Astronomical Column of NATURE, No. 1226 (p. 372), it is worth remark that the nebular theory of the universe is briefly and accurately set forth by Tennyson thus—

> "This world was once a fluid haze of light,
> Till toward the centre set the starry tides
> And eddied into suns, that whirling cast
> The Planets." [*The Princess*.]

A little knowledge of astronomy would have led Coleridge's Ancient Mariner to know that he could never have seen

> "The horned moon, with one bright star within the nether tip."

Tennyson is always accurate in his descriptions of natural phenomena. EDWARD GEOGHEGAN.

Bardsea, February 19.

A Plausible Paradox in Chances.

WITH reference to the paradox in chances mentioned by Mr. Francis Galton in NATURE of February 15 last, I think the following remarks will show very simply where the fallacy lies.

If I assert that at least two out of three coins must turn up alike, I am saying what is evidently true; but if I go on to say that it is an even chance whether a third coin is head or tail, I am assuming that only two coins have been tossed, and that the fate of the third is still uncertain; but this is directly counter to my first assertion, which requires the tossing of three coins.

If this method of reasoning is to be used at all, I must say first that the chance of two coins turning up alike on being tossed is $\frac{1}{2}$, and then that the chance of a third coin being the same as the other two is also $\frac{1}{2}$, and that therefore the required chance of all three being alike is $\frac{1}{2} \times \frac{1}{2}$ or $\frac{1}{4}$.

LEWIS R. SHORTER.

THE PLANET VENUS.

FROM time immemorial the planet Venus has attracted the attention of mankind. Before the days when the "optic tube" began to be turned towards her disc, Venus, we might say, was still in myth, and she was hailed as Hesperus and Phosphorus, according as she was an evening or a morning star, the fact that the same object was in question being then unknown.

Shining as she does at times with a brilliancy surpassing any other body except the moon, it is only natural that she should have been so often sung about by poets in all lands, liking her unto

> "the fair star
> That gems the glittering coronet of morn."

And she is highly honoured by Homer, in that she is the only planet to which he refers:

> Ἕσπερος ὃς κάλλιστος ἐν οὐρανῷ ἵσταται ἀστήρ.
> Hesperus quæ pulcherrima in cœlo posita est stella.

To Galileo belongs the honour of first having viewed the planet through a telescope, but it is curious to remark the lapse of time that he allowed to pass before he made his first observation. The discovery that Venus exhibited phases did not take place until the end of September 1610, though Galileo first observed the satellites of Jupiter on January 7 of that year.

That Galileo should veil this important discovery of the phases of Venus under a Latin anagram,[1] does seem at first rather strange, but when one considers the vast importance of the discovery in that it supplied a simple proof of the planet's revolution round the sun, one can understand that he would first desire to be quite certain of his facts before giving the key to the anagram.

An historical fact of interest with reference to Father Castelli may be mentioned here. In Venturi's collection there is a letter from Father Castelli to the celebrated Florentian astronomer, dated November 5, 1610, in which he asks Galileo whether Venus and Mars show phases. Galileo evidently did not wish to give a direct answer, so evaded the question by saying that, although he was engaged in various investigations, he was better in bed than out in the open air in consequence of great infirmity. It was not until December 30, 1610, that he informed Castelli of his recognition of the cusps.

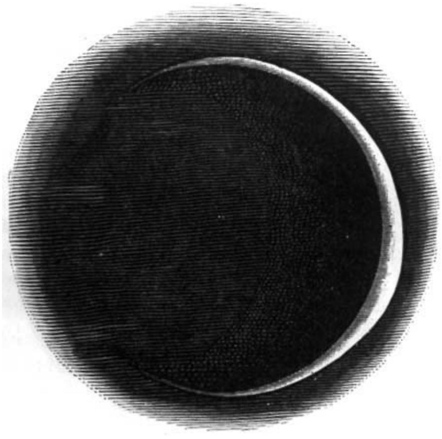


FIG. 1.—February 26, 1878 (Trouvelot).

With an ever-increasing number of telescopes at the disposal of astronomers, it is not astonishing that facts concerning surface markings, form, period of rotation, &c. should be rapidly forthcoming, and the sum total of what we now know about the planet has been gained at the expense of much labour and patience at the eye-piece end of the telescope.

During the past three months Venus has been a striking object in the south-western and western region of the sky, being in a position more than usually favourable for observation. Towards the end of November last her great southern declination began to decrease, while the planet became brighter and brighter, passing her greatest elongation east on December 6. On January 11 she attained her maximum brilliancy, the crescent form gradually increasing until on February 15, that is, at inferior conjunction, it was totally invisible. Gradually the crescent will become visible again, but in the inverse order, and we shall have another maximum on March 22, superior conjunction occurring on November 30. Thus we know that Venus is now lost in the sun's rays, and is, in consequence, invisible to us as an evening star for some time to come. The accompanying illustration (Fig. 1) gives a drawing of the planet as recorded by

---

[1] "Hæc immatura a me jam frustra leguntur," or with the letters properly arranged—"Cynthiæ figuras æmulatu Mater Amorum."

Trouvelot in 1878, at a time when only a very fine crescent was visible. (The bulging at the south-south-east portion of the crescent was observed, and is not a defect in the drawing.)

Of all the planets, Venus approaches us the nearest, her minimum distance amounting sometimes to approximately five million miles, that is, about five times nearer than when she is furthest from us. Unfortunately, at these times her illuminated disc is turned away from us, and all we can do is to direct our attention to the small crescent that remains before inferior conjunction is reached. This accounts for the uncertain knowledge that we possess with regard both to surface markings and the period of rotation. The latter question is still a moot point among astronomers, and it is interesting to note the historical sequence in which these investigations have been made. The first spots on the planet's disc were noted by Dominique Cassini in October and June of the years 1666 and 1667 respectively, and from them he deduced a period of 23h. 21m. Bianchini, about 60 years afterwards (1726–27), came to quite a different result, substituting 24 days 8 hours for that obtained above. Jacques Cassini, discussing his father's observations and those made by Bianchini, concluded that a period of 23h. 20m. satisfied both the old and new observations, but that Bianchini's value would not agree with that of his father. This value seems for some time to have been accepted, and Schroeter's (1798–1799) and De Vico's (1840–42) observations practically confirmed it. Fig. 2 gives a view of the planet as seen on January 19, 1878, and shows the details in the polar spots sometimes available for "period of rotation" determinations.

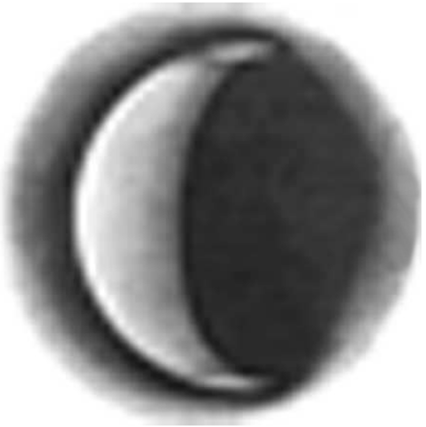
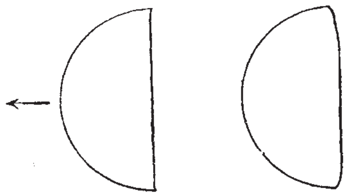


Fig. 2.—Details of snow-caps January 19, 1878 (Trouvelot).

Thus matters stood till that keen-eyed observer Schiaparelli took the field. After a most careful study, extending over many years, in which some single observations were made extending over eight consecutive hours, he was led to make the statement that the rotation of the planet is exceedingly slow, and probably takes place in a period of 224 days 7 hours, the duration of the revolution of Venus about the sun. At Nice, M. Perottin has come to a similar view, expressing his opinion in the following words: "Ne diffère pas de la durée de la revolution sidérale soit 225 jours environ, de plus de 30 jours." These two observers, especially the former, thus upset our whole belief in a short duration of the period, but we are still again brought to consider the question from observations emanating from another source. We refer to those made by Prof. Trouvelot (see Nature, vol. xlvi. p. 470), whose opinion is of great weight. The importance of his work lies in the fact that it was carried on at the same time as that of Schiaparelli "souvent dans la même journée, sous un ciel également propice et précisément sur la même point de la planète." The value ultimately deduced was 23h. 49m. 28s., which again brings us back to a short period. In referring to Schiaparelli's observations he says: "La cause probable de l'erreur de M. Schiaparelli semble résulter de ce fait que les taches *h* et *k*, qui ont servi de base à ses conclusions, faisaient partie de la tache polaire méridionale qui, étant située centralement sur l'axe de rotation de la planète, semble rester stationnaire, comme cela se voit sur la tache polaire de Mars, quand elle se trouve réduite à de faibles dimensions." He also refers to the general features visible on the planet's surface as indications of a rapid rotation, especially that of the rapid deformations of the terminator and hours.



February 5, 2h. February 5, 5h. 43m.

Fig. 3.

Thus we are left with the choice of two periods, one long and consisting of 224 days, the other short, of 24 hours nearly. We leave our readers to adopt that which they think best, the balance of favour falling, in our opinion, slightly towards the 24-hour side of the scale. But just as Schiaparelli's observation of the doubling of the canals of Mars was finally observed and universally accepted, so perhaps time may prove his case as regards this period of rotation.

Some of the most recent work on the planet Venus relates to the measurement of her diameter. Among a few of the reduced measures the following may be given:—Hartwig, with the Breslau heliometer, from forty-three observations obtained a diameter of 17″·67. The same observer, from a reduction of the Oxford observations, and also from Kaiser's observations with Airy's double-image micrometer, obtained 17″·582 and 17″·409 from thirty-three and thirty-four observations respectively. Auwers from the transit of Venus measures deduced the value 16″·801, while Ambronn[1], from thirty-four observations, measured the diameter as 17″·711.

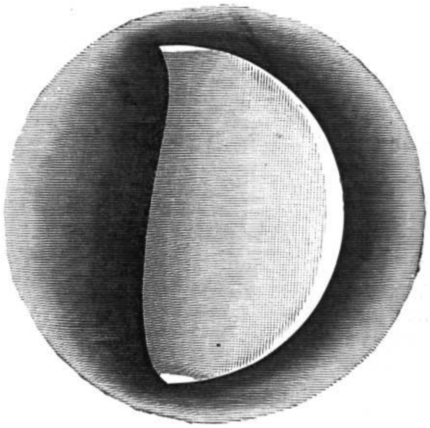


Fig. 4.—Showing irregularity of terminator November 23, 1877 (Trouvelot).

Among other interesting points to which we might refer, are the planet's visibility in full daylight, the snow-caps, the secondary light, the planet's form, &c. Each of these have raised a host of questions at various times, which even yet are not fully answered. The question as to the form of the planet itself is also one full of interest, and observers, from Beer and Mädler down to Trouvelot, have made numerous drawings of the different appearances. Observations have shown that the surface, or whatever it is that we look at, is by no means level, but extremely uneven or irregular. Such irregularities can be best detected naturally at the terminator and limb. Fig. 1 indicates a bulging at the limb, while Fig. 3 shows a similar phenomenon at the terminator at two different times—February 5, 2h. and 5h. 43m. (Perhaps this is one of the best proofs of a "short duration" period for rotation).

---

[1] See *Astr. Nachr.* No. 3204, p. 190.

Fig. 4, which we also owe to Prof. Trouvelot, shows a more decided case of irregularity, and on perhaps a much larger scale.

Much remains, however, to be done before we are on anything like a footing with this planet as we are with Mars. With this latter we can observe directly the land and water markings, time to a second the period of rotation, observe local storms, and many other details; but with the former the case is different. Here the planet is for the most part lost in the rays of the sun, or at other times not very easy for observation.

That Venus has an atmosphere is a fact which has long been known, and that this is denser than the earth's envelope is also very probable. The part this atmosphere plays in the determination of the period of rotation seems to be of great importance, and it is rather a question of whether we have been observing real rigid markings on the planet itself, or only what has been described as "a shell of clouds, the appearances interpreted to signify the existence of lofty mountains, snow-caps, vast chasms, and crater-like depressions, are really nothing but the varying features of cloud scenery."

Whichever the case may be, future observation has still to show; but it seems that with the rapid advance now taking place in large instrument-making, such a question as this could be settled, given a few fine evenings or mornings near a favourable time of observation, a clear and still air, and a large aperture. Such occasions, perhaps, may be rare, but the point at issue is important, and should be settled as soon as possible.

W. J. L.

NOTES.

ALL the arrangements have now been made for the eleventh International Medical Congress, shortly to be held in Rome. The inauguration of the congress will take place on March 29, in the presence of the King of Italy. On the following day will commence the work of the scientific sections, which will be continued till April 5.

A CONGRESS of chemistry and pharmacy will be held in Naples at the beginning of next September. The congress will be divided into two sections—the one scientific, the other professional.

M. EUGENE CATALAN, a member of the Sciences Mathematiques section of the Paris Academy of Sciences, died at Liège on February 14.

ON March 18, Prof. J. Bertrand, the popular perpetual Secretary of the Paris Academy of Sciences, will have spent fifty years in expounding science. In order to celebrate this jubilee in a fitting manner, a committee has been formed, consisting chiefly of his old students at the École Polytechnique, the Sorbonne, the College de France, and the University, and a circular has been issued asking for subscriptions towards a commemorative medal which it is proposed to have struck for the occasion. The committee appeal not only to the eminent professor's old pupils, but also to his colleagues and friends who desire to do him honour. Among the members of the committee are Profs. Cornu, Marcel Deprez, Jordan, Maurice Lévy, Mascart, Mercadier, Picard, Poincaré, and M. Tisserand, the Director of the Paris Observatory. Subscriptions may be sent to any of these names, or to M. le Trésorier, de l'École Polytechnique, 21 Rue Descartes, Paris.

AN offer made by Miss Marian Brockhurst, to build a museum in the public park of Macclesfield, and endow it with £100 a year, has been accepted by the park committee.

AMONG the bequests of the late Mr. Thomas Avery, of Birmingham, is the sum of £2000 to the Midland Institute, and £1000 to Mansfield College, Oxford.

THE Malte-Brun gold medal of the Paris Geographical Society is to be awarded to M. A. Delebecque, for his researches on the French lakes, of most of which he has constructed detailed bathymetrical maps.

WE learn from the *Chemist and Druggist* that the centenary of the birth of Friedlieb Ferdinand Runge, whose name is connected with the discovery of aniline, carbolic acid, and the paraffines of coal-tar, was celebrated at Oranienburg, near Berlin, on February 6, by the unveiling of a memorial tablet in the wall of the present Royal Seminary, which occupies the place where Runge's laboratory formerly stood.

THE Council of the Society of Arts attended at Marlborough House on Friday, when the Prince of Wales, President of the Society, presented to Sir John Bennet Lawes the Albert medal, and a like medal to Sir J. Henry Gilbert, awarded to them in 1893 "for their joint services to scientific agriculture, and notably for the researches which, throughout a period of fifty years, have been carried on by them at the Experimental Farm, Rothamsted."

WE learn that the collection of fossil plants, got together by Mr. James M'Murtrie, of Radstock, has passed away from the county where it was chiefly collected to the Natural History Museum at South Kensington, where it has found a permanent home. The Somerset coal measures generally, and especially the Radstock seams, have long been known for the richness and variety of their fossil flora, which is found in a state of preservation probably not equalled in any other coal-field in the country, and a residence of more than thirty years amidst such surroundings, with the aid of many willing assistants, had enabled Mr. M'Murtrie to accumulate one of the finest private collections in the country. The collection, consisting of more than 300 specimens, includes every variety of plant life of the Carboniferous age, from the smallest variety of fern to the largest tree ferns.

A FINE egg of the gare-fowl or Great Auk was put up for auction by Mr. Stevens, on Thursday, and, after a keen competition, was purchased by Sir Vauncey H. Crewe for 300 guineas. The egg originally belonged to the late Mr. William Yarrell, and the facts relating to its purchase are stated by Prof. Newton in another column. In 1856 the late Mr. Frederick Bond purchased the specimen for twenty guineas. It remained in this gentleman's possession until 1875, when it was sold to Baron Louis d'Hamonville. Of the sixty-eight true specimens of the Great Auk's eggs known to be in existence, Great Britain is said to possess forty-eight; France, ten; Germany, three; Holland, two; Denmark, Portugal, and Switzerland, one each; and the United States, two.

THE origin of gold nuggets is a question about which much controversy has arisen. Dr. A. R. Selwyn long ago suggested that the nuggets grow in alluvial deposits by the deposition of